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Prevalence of Chlamydia trachomatis among young German adolescents, 2005–06

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Abstract

Background: Chlamydia trachomatis prevalence among 12–17-year-old adolescents in Germany was determined in the present study.

Methods: A random age-stratified sample of 1815 urine specimens of boys and girls was selected from a population-based nationwide health survey conducted in 2003–06. Urine samples were pooled and tested for chlamydia using strand displacement amplification. Positive pools were individually retested. Prevalence, prevalence ratios (PR) and corresponding 95% confidence intervals (CI) were calculated. Associations between infection and socio-demographic factors (age, sex, place of residence), sexual activity (defined by oral contraceptive use or gynaecologist visits) and abdominal pain among females were examined in univariate analysis.

Results: Sixteen samples (0.9% 95% CI: 0.5–1.3%), all from 15–17-year olds, were positive for chlamydia. Prevalence increased with age to 2% (95% CI: 0.8–3.2%) among 17 year olds and was higher among girls than boys (1.8% v. 0.1%; P < 0.001). A total of 4.6% (95% CI: 1.4–7.7%) of sexually active girls aged 17 were infected and 5/7 of them had no regular abdominal pain. Of all girls with abdominal pains, 52% had visited gynaecologists. Prevalence of infection was higher among those with pains than those without (PR = 3.8, 95% CI: 1.3–11.0).

Conclusions: This is the first nationwide study based on a representative sample of boys and girls to measure chlamydia prevalence among adolescents in Germany. Prevalence in Germany is consistent with other countries. Among sexually active females, prevalence was comparable to screening thresholds. As gynaecological visits were common among females, we recommend that gynaecologists should actively offer screening to sexually active females, which would strengthen the newly implemented screening for females under 25 years.

Introduction

Chlamydia trachomatis is worldwide the most common sexually transmissible bacterial infection especially among women and men aged 16–19 and 20–24, respectively. Although chlamydia is not notifiable in Germany, it is the most frequently reported disease in German sentinel surveillance. [1] There are, however, no representative data for chlamydia prevalence in Germany. For women, a prevalence of 6.5% among ≤20 year olds attending gynaecologists and 6.4% among sexually active 14–21-year olds attending schools was found in Berlin in 2004. [2,3] A nationwide health survey, based on a representative sample of individuals aged 0–17 years, was conducted across Germany in 2003–06. [4] We tested urine collected during the survey to estimate chlamydia prevalence among

adolescents in Germany.

Methods

We selected an age-stratified random sample of 1815 from 5755 boys and girls aged 12–17 years. Urine samples were tested for chlamydia using strand displacement amplification (BD ProbeTec ET System; Franklin Lakes, NJ, USA). Assays were carried out according to the manufacturer's instructions, except 500 µL instead of 4 mL was used. Based on the expected low prevalence and to save costs, samples were pooled by four. Urine samples from positive or inhibitory pools were individually retested.

Socio-demographic factors (age, sex, residence, alcohol consumption and smoking habits), sexual activity proxies for girls (defined by oral contraceptive (OC) use or gynaecologist visits) and potential symptoms (regular abdominal pains) were extracted from the survey database. STATA (version 10; Stata Corporation, College Station, TX, USA) was used to calculate prevalence, prevalence ratios (PR) and corresponding 95% confidence intervals (CI) and examine associations between risk factors and infection. Charité Hospital, Berlin, obtained ethical approval.

Results

All selected urine samples were collected in 2005–06. A total of 1807 samples were successfully tested, of which 952 (53%) belonged to men. A considerable proportion had smoked (27%) or regularly consumed alcohol (>1 glass/week) (28%). By the age of 17, 37% were assumed to be sexually active. 52% of all women with regular abdominal pains had visited gynaecologists.

Chlamydia prevalence was 0.9% (95% CI: 0.5–1.3%) among 12–17-year olds in 2005–06; all positive were aged 15–17 (Table 1).

Prevalence increased with age to 2% (95% CI: 0.8–3.2%) among 17 year olds and was significantly higher among girls than boys (1.8% $v.$ 0.1%, $P < 0.001$). Girls aged 17 were at 10-fold higher risk of infection than boys of the same age ($P = 0.005$). Prevalence was higher among girls with abdominal pains than those without (PR = 3.8, 95% CI: 1.3–11.0). Among sexually active girls aged 15, 3.6% (95% CI: –3.8 to 10.9%) were infected, which rose to 4.6% (95% CI: 1.4–7.7%) among those aged 17. Five from seven had no abdominal pains.

Restriction of analysis to females aged 17 found no correlation between education level, drug, cigarette and alcohol consumption and increased risk of chlamydia. Although prevalence was higher among OC users (PR = 1.2, 95% CI: 0.4–4.1), gynaecologist visits (PR = 2.4, 95% CI: 0.5–11.0), and those with abdominal pains (PR = 2.9, 95% CI: 0.8–10), differences were not significant.

Discussion

The overall prevalence in our population was low and increased with age, which is closely linked to sexual debut. A German study found that 11% of girls at 14 were sexually active, which increased to 66% at age 17. [5] Consistent with population-based prevalence from the UK and Netherlands (3.8% and 2.6% among women <20 and 15–19 years, respectively), [6,7] prevalence was high among girls in this study; while being very low among boys. Young females may seek older male partners, with whom they have earlier sexual onset and less likely to use contraceptives than peers with boyfriends of a similar age. [8] Many girls visiting gynaecologists had regular abdominal pains, which although are unspecific symptoms, could be indicative for undetected chlamydia. Among sexually active females prevalence was comparable to screening thresholds of 3–10%, thus warranting screening in this group.

It is possible that the use of pooled urine samples, as proposed by the recently implemented screening program in Germany, may affect testing quality. [9] Due to limited availability, less urine than recommended was used. Urine samples were not first void, which is preferred as they contain the greatest concentration of chlamydial elementary bodies. With each following void, the number of positives that can be detected may decrease. [10] Urine also contains less chlamydia than cervical swabs, which were used in the Berlin studies, and may partly explain their higher prevalence rates. Together these factors may have influenced the prevalence in our population.

Despite limitations, these findings provide the first representative prevalence rates among young adolescents in Germany. As gynaecological visits were common among females, we recommend that gynaecologists should actively offer screening to sexually active girls. A similar study is required among young adults to provide prevalence among men and further improve the evidence-base for screening in Germany.

Conflicts of Interest

None declared.

Acknowledgements

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